

ABSTRACT OF THE DISCLOSURE

A synchronized optical clocking signal is provided to a plurality of optical receivers by providing a layer of a high absorption coefficient material, such as SiGe or Ge, on a front surface of a low absorption coefficient substrate, such as silicon. Diodes are formed in the germanium containing layer for receiving an optical signal and converting the optical signal into an electrical signal. An optical clocking signal is shined on the back surface of the silicon substrate. The light has a wavelength long enough so that it penetrates through the silicon substrate to the germanium containing layer. The wavelength is short enough so that the light is absorbed in the germanium containing layer and converted to the electrical clocking signal used for neighboring devices and circuits. The germanium concentration is graded so that minority carriers are quickly swept across junctions of the diodes and collected.

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